

THE RISK OF SPINAL PUNCTURE

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I WOULD prefer to use a more cumbersome title, namely, "The risk of over-stressing the dangers incident to spinal puncture". Far be it from me to encourage carelessness or recklessness in the performance of any surgical procedure, but for several years I have held the opinion that the dangers in connection with the operation of spinal puncture have not been stated quite fairly. Instances of sudden death following spinal puncture in cases of brain tumour have been reported, but in such reports a very pertinent question is usually overlooked. How many of these cases could have been saved by other procedure had spinal puncture been omitted? I would venture to suggest that the great majority of such cases were probably hopeless and should not be used to support the argument against spinal puncture.

Ventricular puncture in the presence of a very high degree of papilloedema is admittedly dangerous, but craniotomy under the same circumstances without ventricular puncture is even more dangerous, and so one does not condemn ventricular puncture, but recommends that it be employed with due regard to the safest possible technique. I believe the same advice should apply to the use of spinal puncture. It is my belief that the dangers of spinal puncture in the presence of increased intracranial pressure have been overstated. As a result of supposedly authoritative warnings this valuable diagnostic procedure at times has been withheld, or delayed, with detriment to the patient.

Encephalitis, syphilitic or non-syphilitic, may cause increased pressure with definite papilloedema, and the clinical picture may simulate that of brain tumour. The history may be misleading or quite unreliable. Examination of the spinal fluid in such cases is admittedly of great value. One negative blood Wassermann test does not exclude cerebral syphilis. Does the relative value of the information to be obtained by spinal puncture exceed the risk entailed? I think it does. In my opinion there is only one absolute contraindication to spinal puncture, and that is the probable presence of an intra-dural abscess, which of course includes true brain abscess.

Of the relative contraindications I would put first the probability of brain tumour in the posterior fossa, and second the probability of hæmorrhage from an intracranial aneurysm. I do not consider either of these an absolute contraindication provided due caution is observed. Even when tumour in the posterior fossa is suspected I believe two or three c.c. of cerebrospinal fluid may be removed slowly, without great danger. This quantity should be sufficient for the differential cell count, Wassermann test, and gold curve. When there is no papilloedema and no appreciable fall in the spinal pressure 6 or 8 c.c. may be removed for complete examination. An initial high pressure with a rapid fall should be recognized as a danger signal. A manometer should be used, not once but repeatedly, during the procedure where a high initial pressure is found.

It is common to see either at operation or at autopsy extensive herniation of the cerebellum through the foramen magnum, but I am not aware of any positive proof that such herniation is of sudden occurrence. I would doubt that a water-tight plugging of the foramen magnum often occurs; otherwise, one might expect occasionally to see spastic quadriplegia associated with tumour in the posterior fossa, produced by the gradual absorption of the cerebrospinal fluid from the spinal canal.

In a review of the records of the University of Alberta Hospital, I am able to find only one case during the past six years of a patient with a brain tumour dying on the same day that spinal puncture was performed. That was in a case of a very large meningioma in the left frontal region. The patient had been admitted to hospital in a stuporous state. There was also one patient with intracranial aneurysm and one with occipital lobe abscess dying within twenty-four hours of spinal puncture. I have examined the records of the same hospital for the years 1936 and 1937 and have picked out those cases of intracranial tumour and encephalitis in which there has been a positive record of papilloedema; tumour cases without papilloedema or with optic atrophy have not been included. Analysis of the records of these cases is shown in the accom-

TABLE I.

University of Alberta Hospital Number	Spinal pressure mm. of mercury	Cells	Papilloedema slight	Papilloedema severe	Number of spinal punctures	Encephalogram	Ventriculogram	Diagnosis	Operation	Result	Autopsy
1936					.						
24065	20	5	..	+	2	..	+	Ependymoma, 4th ventricle.	Removal.	Discharged well.	..
24192	16	4	+	..	1	+	..	Glioblastoma, right frontal.	Partial removal.	Died—3 days.	..
24528	34	6	+	..	1	..	+	Glioblastoma, right parietal.	Removal.	Discharged well.	..
20372	18	6	..	+	1	..	+	Cerebellopontine fibroma.	Cerebellar decompression.	Discharged improved.	..
26929	18	320	+	..	1	..	..	Abscess, left occipital.	Decompression drainage.	Died—2 days.	+
25294	20	330	+	..	3	..	..	Encephalitis epidemic.	.....	Discharged improved.	..
25499	28	80	+	..	13	+	..	Encephalitis.	.....	Improved.	..
25151	28	7	..	+	1	..	+	Astrocytoma, left occipital.	Partial removal.	Died—15 days.	+
26015	18	4	..	+	3	..	+	Craniopharyngioma.	Declined.	Improved.	..
25573	20	5	..	+	1	..	..	Angioma, cerebellar.	Decompression, cerebellar.	Died—5 days.	+
26772	30	4	..	++	2	+	..	Astrocytoma, right frontal.	Partial removal.	Died—99 days.	+
26691	56	2	..	+	1	..	+	Glioblastoma, right parietal.	Removal.	Died—32 days.	+
26223	32	3	..	+	1	..	..	Medullablastoma, cerebellar.	Partial removal.	Discharged improved.	..
1937											
28852	18	2	+	..	1	+	..	Astrocytoma, right parietal.	Removal of tumour.	Discharged well.	..
30209	28	0	+	..	1	..	+	Encephalitis.	Temporal decompression.	Died— 5 days.	+
29323	..	..	..	+	..	..	+	Glioma, 3rd ventricle.	Ventricular drainage only.	Died—130 days.	+
19371	20	5	..	+	1	..	+	Glioma, right parietal.	Partial removal.	Died— 4 days.	+
29111	30	6	+	..	1	..	+	Glioma, right frontal.	Flap exploration.	Died— 9 days.	+
29219	38	4	..	+	1	..	+	Astrocytoma, fronto-parietal, right.	None.	Died— 40 days.	+
31022	36	11	..	+	10	..	..	Encephalitis.	.....	Discharged improved.	..
26772	20	6	..	+	3	+	..	Glioma, right frontal.	Partial removal.	Died—120 days.	..
29327	10	250	+	..	1	..	..	Encephalitis.	.....	Discharged improved.	..
27403	30	5	..	+	1	..	+	Cyst, left occipital lobe.	Removal.	Discharged well.	..
29144	10	10	+	..	1	..	..	Encephalitis.	.....	Discharged improved.	..
27518	14	7	..	+	2	..	..	Meningioma, right frontal.	Removal.	Discharged well.	..

N.B.: Re No. 26772—Encephalogram done sixty days after operation.

panying table. The post-operative mortality rate is high, but these were all cases with papilloedema, and I am not convinced that in any case death was hastened by spinal puncture before operation.

The medico-legal importance of an unqualified statement that spinal puncture should not be done in the presence of papilloedema should not be overlooked. Such a statement, separated from its context, might be used unfairly in a court room.

It is probable that every patient with cerebral symptoms passes through the hands of at least

one general practitioner before arriving at a qualified neurologist or neuro-surgeon. It is impractical that all such patients should be sent at once to a specialist where distances are great. Any rural district hospital will have a sphygmomanometer and at least one member of the staff who knows how to use it. The same should apply to the spinal manometer. I hold that all modern graduates in medicine should be familiar with the proper technique of spinal puncture, and capable of making a correct appreciation of the findings, avoiding on the one hand rashness, and on the other undue timidity.